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NOTES ON GEOGRAPHIC DISTRIBUTION

First record of the common house gecko *Hemidactylus frenatus* Schlegel, 1836 and distribution extension of *Phyllodactylus reissii* Peters, 1862 in the Galápagos

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ABSTRACT: Among introduced species in the Galápagos are three species of geckos – *Gonatodes caudiscutatus*, *Lepidodactylus lugubris*, *Phyllodactylus reissii* – occurring on the islands of Isabela, San Cristóbal, and Santa Cruz. Here we report the first record of a fourth invasive species of gecko from Isabela, as well as the first record of *P. reissii* from the same island.

Invasive species represent one of the major threats to the unique biodiversity of the Galápagos. Some invasive species are conspicuous and obviously harmful (*e.g.*, goats, blackberries), and many efforts have been made to erradicate them (Tapia *et al.* 2000; Carrión *et al.* 2008). Others, however, are small or cryptic (*e.g.*, cockroaches, fire ants), and often difficult to detect (Lubin 1984; Peck *et al.* 1998). The impact caused by these small invaders represents a major challenge, and therefore, prevention or erradication programs are more difficult to establish. Among the small invaders are three species of geckos (Bungartz *et al.* 2011), the only introduced reptiles with established populations in the Galápagos, which share the islands with six endemic species of geckos (Table 1). More than a century ago, the first record of an introduced gecko – *Gonatodes caudiscutatus* Günther 1859 – from San Cristóbal Island was published, although it was originally described as a different species – *G. collaris* – by Garman (1892; synonymy fide Vanzolini 1965). This species is widely distributed along the Pacific versant of the Andes in Colombia, Ecuador, and Peru (Burt 1932; Torres-Carvajal 2001; P. Venegas personal communication). While working on the reptiles of the Galápagos Garman received a small collection from Guayaquil (mainland Ecuador), and according to Van Denburgh (1912) it remains unclear whether the specimens of *G. caudiscutatus* examined by Garman were collected in the Galápagos or Guayaquil. Nonetheless, the occurrence of this species in San Cristóbal has been subsequently confirmed (*e.g.*, Mertens 1963; Wright 1983; Olmedo and Cayot 1994). Another introduced species is *Phyllodactylus reissii* Peters 1862, which occurs naturally along the Pacific coast of southern Ecuador and northwestern Peru (Dixon and Huey 1970). This species was found around 1975 in Puerto Ayora, Santa Cruz Island, and was confirmed as a well-established species in that town in 1988 (Hoogmoed 1989). The third known species of an introduced gecko is *Lepidodactylus lugubris* Duméril and Bibron 1836, a parthenogenic species from the Western Pacific that has invaded many Pacific islands and the Pacific coast of Central and South America. In the Galápagos, this species has been introduced to Santa Cruz, San Cristóbal, and Isabela (Hoogmoed 1989; Olmedo and Cayot 1994). Herein we report the first records of a fourth species of invasive gecko new to the Galápagos, as well as a new island record of *P. reissii*.

During a field collecting trip to Puerto Villamil (0°57'26.42" S, 90°58'2.56" W, WGS84, 0 m), Isabela Island, between 6–8 January 2011, three individuals of *Hemidactylus frenatus* (QCAZ 11128, 11164–65) and two of *Phyllodactylus reissii* (QCAZ 11186–7) were hand captured. All specimens were collected under collection permit PC-05-10 issued by Galápagos National Park, and were deposited at Museo de Zoología QCAZ of Pontificia Universidad Católica del Ecuador (PUCE). Specimens of both species (Figure 1) were found active between 20:00 h–23:00 h on house walls at 1–3 m above ground, usually in areas exposed to artificial light. Although two more specimens of each species were sighted, they were largely outnumbered by *Lepidodactylus lugubris* (Figure 1), which seemed to prefer light posts and palm trees. On a single night (January 6th), 30 specimens of *L. lugubris* were captured by five people between 21:00 h–23:00 h in a two block area of Puerto Villamil. During the same collecting period 24 specimens of the endemic species *P. galapagoensis* were found (Figure 1); they seemed to prefer darker areas closer to the ground, such as lava rock piles.

Without further studies monitoring the species of introduced geckoes on Isabela, it remains unclear whether the specimens of *Hemidactylus frenatus* and *Phyllodactylus reissii* reported here were part of well-established populations. The common house gecko *H. frenatus* has its natural range in tropical Asia and the Indo-Pacific (Case *et al.* 1994), and has been introduced in many tropical and subtropical regions worldwide (Bauer and Henle 1994) including the Pacific coast of Ecuador (Jadin *et al.* 2009),

were it seems to be expanding at a rapid rate (Carvajal-Campos and Torres-Carvajal 2010). Even though nothing is known about the impacts of introduced *H. frenatus* on other species, its seemingly good dispersal ability represents a potential threat for endemic species in Isabela and other islands. The presence of *P. reissii* in Isabela is not surprising, as this species is well-established in Santa Cruz and there is intensive human and cargo traffic between both islands. The last time that the gecko fauna of Puerto Villamil was thoroughly sampled was in the early 1990s, and *L. lugubris* was the only introduced species reported (Olmedo and Cayot 1994). Therefore, both *H. frenatus* and *P. reissii* have probably arrived on Isabela sometime during the last two decades.

Table 1. Origin, activity and distribution (Van Denburgh 1912; Lanza 1973; Olmedo and Cayot 1994) of geckos in the Galápagos.

SCIENTIFIC NAME	ORIGIN	ACTIVITY	ISLAND(S) OF OCCURRENCE
Gonatodes caudiscutatus	Introduced	Diurnal	San Cristóbal
Hemidactylus frenatus	Introduced	Nocturnal	Isabela
Lepidodactylus lugubris	Introduced	Nocturnal	Isabela, San Cristóbal, Santa Cruz
Phyllodactylus barringtonensis	Endemic	Nocturnal	Islote Santa Fe, Santa Fe
Phyllodactylus bauri	Endemic	Nocturnal	Española, Floreana, Gardner near Española
Phyllodactylus darwini	Endemic	Nocturnal	San Cristóbal
Phyllodactylus galapagoensis	Endemic	Nocturnal	Baltra, Bartolomé, Cowley, Daphne, Fernandina, Isabela, Islote Mares, Pinzón, Plaza Norte, Plaza Sur, Santa Cruz, Santiago, Seymour, Tortuga
Phyllodactylus gilberti	Endemic	Nocturnal	Wolf
Phyllodactylus leei	Endemic	Nocturnal	San Cristóbal
Phyllodactylus reissii	Introduced	Nocturnal	Santa Cruz, Isabela

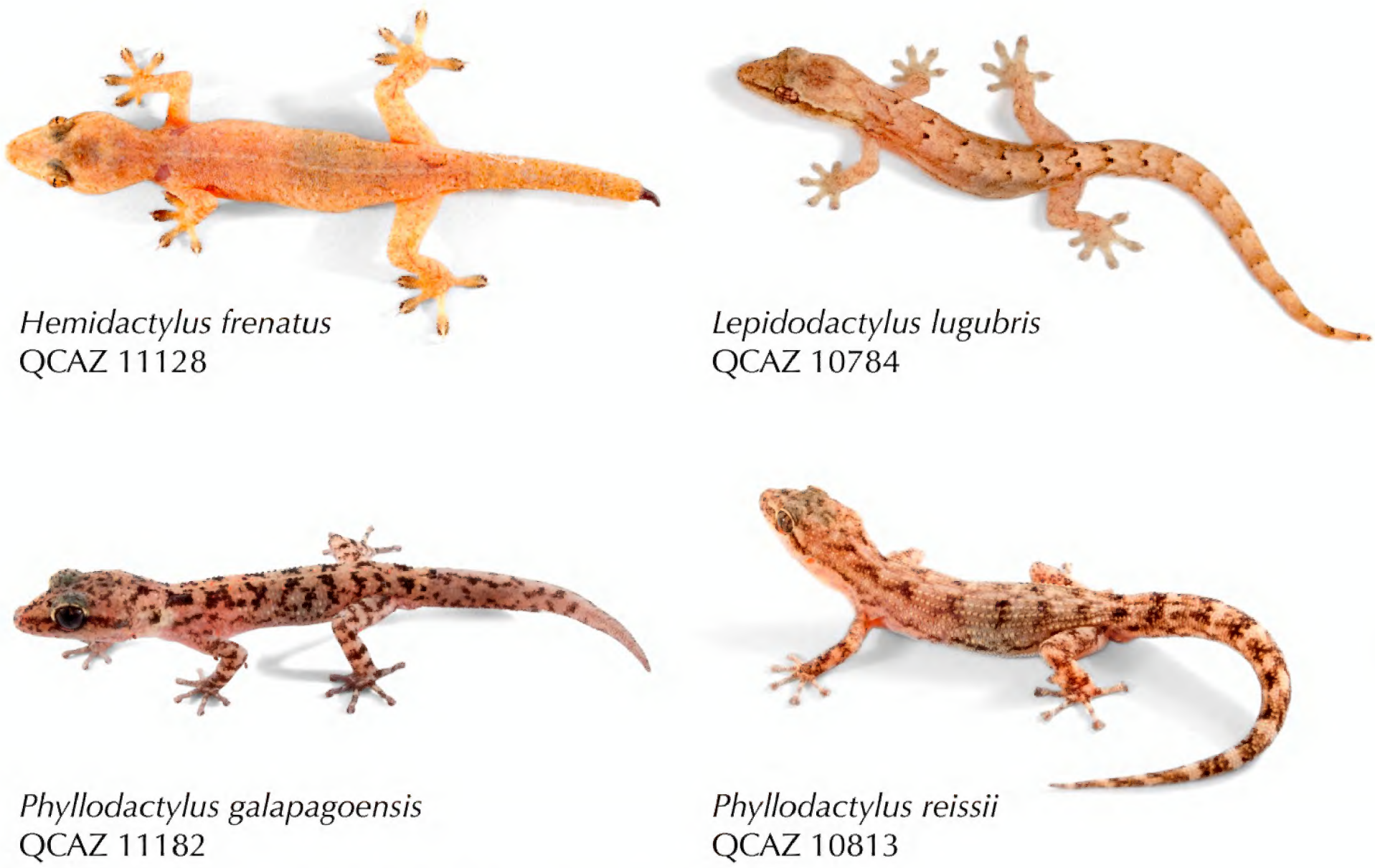

Figure 1. Species of geckos from Isabela Island, Galápagos. Photographs: O. Torres-Carvajal.

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